--19. (New) A control unit for controlling a safety-critical application, the control unit comprising:

a microcomputer;

a monitoring unit including a first arrangement for measuring a quiescent current of the microcomputer, and including a second arrangement for applying a test data input signal, for processing test data output signals and for comparing a corresponding test data output signal of the microcomputer to a corresponding test data output signal of the monitoring unit;

at least one quiescent current handshake line running between the first arrangement and the microcomputer for controlling the measuring of the quiescent current;

at least one test data signal transmission line running between the second arrangement and the microcomputer; and

peripheral circuits.

20. (New) The control unit of claim 19, wherein:

the first arrangement includes an IDDQ measuring circuit, a voltage supply, an IDDQ measuring run control, and a control system of the monitoring unit;

the at least one quiescent current handshake line includes two handshake lines running from the IDDQ measuring run control to the microcomputer;

the first arrangement and the microcomputer are coupled by the two handshake lines and at least one voltage supply line running from the voltage supply to the microcomputer; and

at least one of the at least one voltage supply line runs through the IDDQ measuring circuit.

21. (New) The control unit of claim 20, wherein the at least one voltage supply line includes two voltage supply lines running between the voltage source and the microcomputer, and one of the two voltage supply lines runs through the IDDQ measuring circuit.

22. (New) The control unit of claim 19, wherein:

the first arrangement includes an IDDQ measuring circuit, a voltage supply, an IDDQ measuring run control, and a control system of the monitoring unit;

the at least one quiescent current handshake line includes two handshake lines running from the IDDQ measuring run control to the microcomputer; and

at least one voltage supply line running from the voltage supply to the microcomputer, at least one of the at least one voltage supply line running through the IDDQ measuring circuit.

23. (New) The control unit of claim 20, wherein the first arrangement includes an initialization circuit for receiving an initialization signal from the voltage source after the control unit is switched on, and for subsequently transmitting an enable signal to the IDDQ measuring run control to enable an IDDQ measurement.

24. (New) The control unit of claim 19, wherein:

the second arrangement includes a test data signal generator for applying the test data input signal to the microcomputer, a response generator for processing the test data input signal and for forming the corresponding test data output signal, a test data register for receiving the test data input signal and for transmitting the corresponding test data output signal, and a comparator for comparing the corresponding test data output signal of the microcomputer to the corresponding test data output signal of the monitoring unit; and

the at least one test data transmission line runs between the test data register of the second arrangement and the microcomputer.

25. (New) The control unit of claim 24, wherein the at least one test data transmission line includes two test data transmission lines.

26. (New) The control unit of claim 24, wherein the second arrangement includes a trigger generator for determining an instant at which the corresponding test data output signal of the microcomputer is available at the comparator, the microcomputer being error-free.

27. (New) The control unit of claim 24, wherein the second arrangement includes an error counter for counting an error if at least one of the following is satisfied: the corresponding test data output signal of the microcomputer is not consistent with the corresponding test data output

signal of the monitoring unit; and the corresponding test data output signal of the microcomputer is available at the comparator at a different instant than one determined by the trigger generator.

28. (New) The control unit of claim 27, wherein there is a plurality of response thresholds for use with the error counter, and a different reaction results by exceeding each response threshold of the plurality of response thresholds results.

29. (New) The control unit of claim 25, wherein the first arrangement includes an initialization circuit for receiving an initialization signal from the voltage source after the control unit is switched on, for subsequently synchronizing the monitoring unit with the microcomputer, and for then activating the test data signal generator and the error counter.

30. (New) A method for testing a microcomputer of a control unit for controlling safety-critical applications, the control unit including the microcomputer, a monitoring unit, and peripheral circuits, the method comprising:

measuring a quiescent current of the microcomputer, the measuring of the quiescent current being controlled by the monitoring unit;

exchanging at least one handshake signal between the microcomputer and the monitoring unit;

applying a test data input signal to the microcomputer;

determining a first test data output signal; and

comparing a second test data output signal of the microcomputer to the first test data output signal of the monitoring unit.

31. (New) The method of claim 30, wherein a quiescent current measurement corresponds to an IDDQ measurement.

32. (New) The method of claim 31, wherein the IDDQ measurement is performed after the control unit is switched on after being enabled by an enable signal.